

PSEUDOXENETUS REGALIS
(HETEROPTERA: MIRIDAE: ORTHOTYLINAE):
SEASONAL HISTORY AND DESCRIPTION OF FIFTH INSTAR

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Abstract.—The seasonal history of the mirid *Pseudoxenetus regalis* (Uhler) was followed on white oak, *Quercus alba* L., in central Missouri during 1984–1986. This univoltine species is a specialist feeding only on oaks. Overwintering eggs hatched in early April; adults first appeared in early May and are present until the end of May. Notes are given on the North American distribution, polymorphism, and host plants. The fifth-instar nymph is described and illustrated.

Pseudoxenetus regalis (Uhler) is widely distributed in eastern North America (Carvalho, 1958) and one of many plant bugs restricted to feeding on oaks, *Quercus* spp. Despite this wide distribution, virtually nothing is known regarding the biology of this species. Two color morphs exist and were initially described as separate species by Uhler (1890). The morph "*scutellatus*" usually has a black pronotum and white scutellum and "*regalis*" usually has an orange pronotum and white scutellum. Henry (1985) concluded that *regalis* and *scutellatus* were conspecific and placed *regalis* as the senior synonym of *scutellatus*.

Herein I outline the seasonal history of *P. regalis* based on samples collected in Missouri during 1984–1986, discuss the distribution, polymorphism, and the host plants of this species, as well as describe and illustrate the fifth instar nymph.

STUDY SITE AND METHODS

The study site in Columbia (Boone Co.), Missouri, was an open field dominated by large white oak, *Quercus alba* L., and shagbark hickory, *Carya ovata* (Mill.) K. Koch, with an understory of closely mowed grasses and forbs, surrounded by a mature oak-hickory woodland border.

I sampled weekly from early May to mid-June 1984. In 1985–1986, sampling began in late March to determine earliest eclosion and thereafter collections were made every 3–4 days until adults were no longer collected (early June). Mirids were sampled by sweeping branches with a standard 15-inch beating net. All specimens taken during ca. 20 minutes of sampling were captured. The number taken was small, with a typical sample consisting of only 4–10 specimens. Immatures were placed in alcohol and sorted to instar in the laboratory; adults were killed using ethyl acetate, mounted, labeled, and deposited, with the immatures, as voucher specimens in the Wilbur R. Enns Entomology Museum (EMUM), University of Missouri–Columbia.

To determine oviposition sites, adults were caged on twigs of white oak in the laboratory and any oviposition noted.

RESULTS AND DISCUSSION

Seasonal history (Fig. 1). Hatching of overwintering eggs occurred shortly after the leaves began to unfold, approximately 14 April in 1985 and 9 April in 1986. Early instars (1st–2nd) were observed feeding on the staminate flowers and expanding leaves. Early instars are whitish green, closely resembling the color of the flowers and young foliage. Subsequent instars (3rd–5th) are red to reddish brown and easily observed feeding on the staminate flowers and foliage. The population consisted of second instars by mid-April and third and fourth instars by late April. In both 1985 and 1986 fifth instars were first collected on 29 April. Adults were first collected on 3 May in 1985 and 1 May in 1986, and were present for only 3–4 weeks both years. Adults last appeared in the weekly collections on 30 May in 1985 and 13 May in 1986. Three females were collected on 7 June in 1984. The latest known collection of *regalis* in Missouri is 24 June (Blinn and Yonke, 1985).

In the laboratory a female deposited a single egg 3.5 mm below one of next year's lateral leaf buds. The egg was placed perpendicular to the stem just beneath the surface of the stem.

Geographic distribution and polymorphism. Figure 2, compiled from the literature and specimens examined in the Wilbur R. Enns Entomology Museum, shows the North American distribution of each color morph for *regalis*. In general, *regalis* is widely distributed east of the 100th meridian. Both color morphs can be found throughout its distribution; however, there is a gradation from north to south with the "*scutellatus*" morph more common in the North and the "*regalis*" morph more common in the South (Henry, 1985).

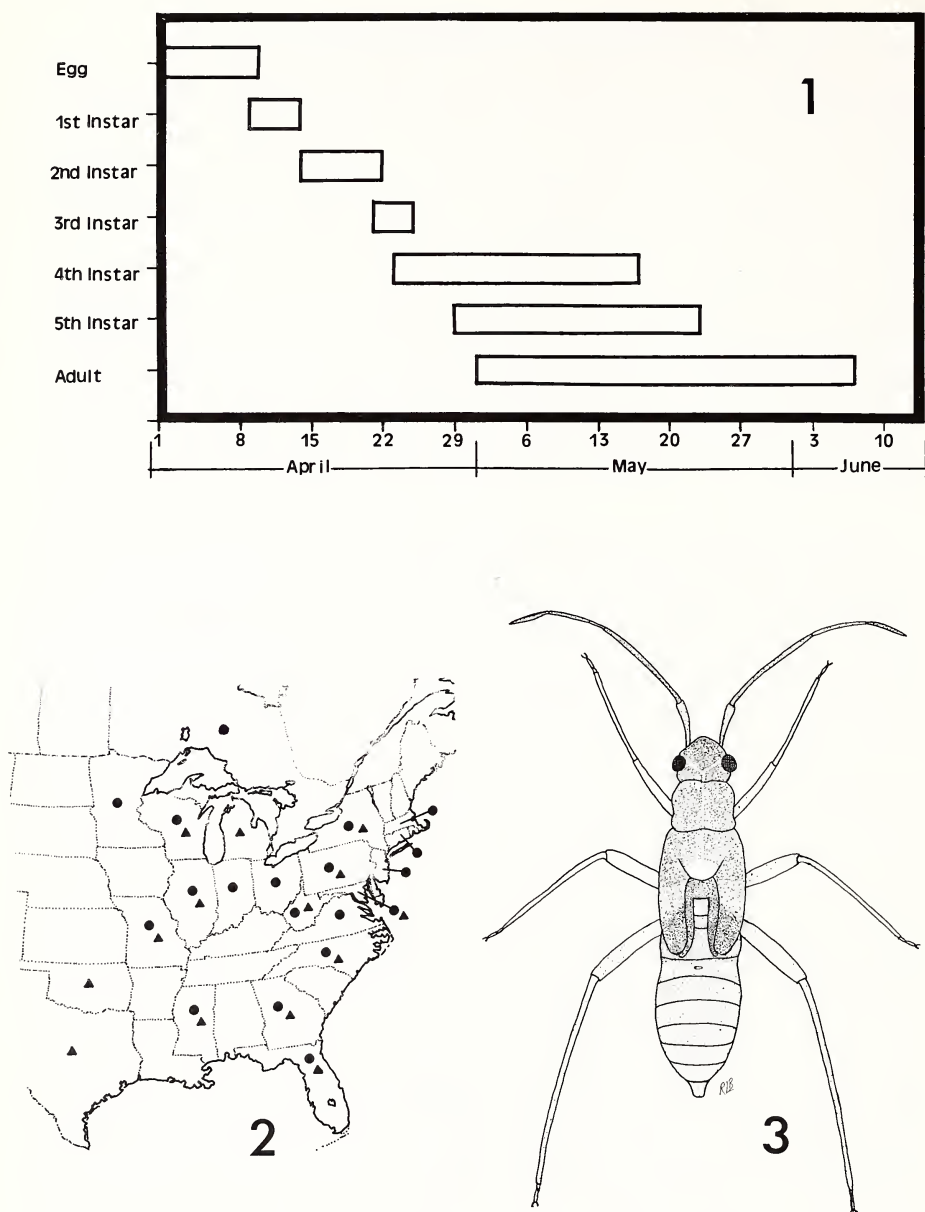
Froeschner (1949) noted that *regalis* was less common than *scutellatus* in Missouri. Of 130 Missouri specimens examined, 17% fit the "*regalis*" morph and 83% the "*scutellatus*" morph. Considerable color variation exists in this species. Several "*scutellatus*" morphs have the scutellum fuscous to black rather than the typical ivory white. One specimen examined from Liberty Co., Florida, fits the typical "*scutellatus*" morph except the scutellum is orange.

Nymphs apparently do not show the color variation that characterizes the adults. The description of the fifth instar below is based on specimens obtained from the study population in which 8% of the adults collected fit the "*regalis*" morph and 92% fit the "*scutellatus*" morph.

Host plants. *Pseudoxenetus regalis* is a specialist feeding only on oaks. Froeschner (1949) stated that *regalis* was common on the foliage of oaks in open woods. Specimens examined in the Wilbur R. Enns Entomology Museum have been taken on *Quercus alba*, *Q. imbricaria* Michx., *Q. rubra* L., *Q. stellata* Wang. and *Q. velutina* Lam. Additional host records include *Q. marilandrica* Muenchh., *Q. prinoides* Willd. (= *muhlenbergii*), and *Q. virginiana* Mill. (Knight, 1941).

In addition to oaks, adults have been recorded from apple, *Pyrus malus* L., and ash, *Fraxinus* sp. (Knight, 1941). I have examined a specimen collected on hickory, *Carya* sp., at Columbia, Missouri (EMUM). These are not true hosts and should be considered adventitious records.

Description of fifth instar ($N = 5$) (Fig. 3). Length 4.50–5.35 mm; elongate, somewhat formicoid, uniformly, sparsely clothed with erect, pale setae. Head: width across eyes 0.87 mm, vertex 0.52 mm, frons and vertex reddish brown, gula red. Rostrum: length



Figs. 1–3. 1. Generalized seasonal history of *Pseudoxenetus regalis* (Uhler) in central Missouri, 1984–1986. 2. North American distribution of *Pseudoxenetus regalis* (Uhler): “regalis” morph (closed triangles), “scutellatus” morph (closed circles). 3. *Pseudoxenetus regalis* (Uhler), fifth instar nymph.

1.53 mm, reaching mesocoxae; yellowish, apex of segment IV black. Antennae: with fine recumbent setae; segment I, length 0.61 mm, yellowish, red longitudinal line dorsally; II, 1.59 mm, red; III, 0.91 mm, testaceous, basal $\frac{1}{3}$ yellowish; IV, 0.69 mm, red. Pronotum: length 0.74 mm, humeral width 0.91 mm, reddish brown, with narrow medial line pale. Scutellum white. Wingpads reddish brown reaching apex of 3rd abdominal segment. Abdomen red, variegated with pale specks, transverse band between 3rd and 4th segments and apical third of 8th segment pale, 9th and 10th segments reddish brown. Legs yellowish; pro- and mesocoxae reddish; pro- and mesofemora with brownish longitudinal line dorsally; mesotibiae brownish on ventro-basal half, metafemora red, apex yellowish; metatibiae red, distal third yellowish; 2nd tarsal segment reddish brown.

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